



Complete Summary

GUIDELINE TITLE

Practice management guidelines for hemorrhage in pelvic fracture.

BIBLIOGRAPHIC SOURCE(S)

EAST Practice Management Guidelines Work Group. Practice management guidelines for hemorrhage in pelvic fracture. Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2001. 15 p. [34 references]

COMPLETE SUMMARY CONTENT

SCOPE

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EVIDENCE SUPPORTING THE RECOMMENDATIONS

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IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

Hemorrhage in pelvic fracture

GUIDELINE CATEGORY

Management

CLINICAL SPECIALTY

Emergency Medicine
Orthopedic Surgery
Radiology
Surgery

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

To present recommendations for the management of hemorrhage in pelvic fracture, focusing on three core questions:

- Which patients warrant external stabilization?
- Which patients warrant pelvic angiography and possible embolization?
- Which patients warrant urgent or emergent laparotomy?

TARGET POPULATION

Patients with pelvic fracture who have signs of bleeding (hemorrhage) in the pelvis

INTERVENTIONS AND PRACTICES CONSIDERED

1. Pelvic stabilization
 - Early external pelvic stabilization
 - Internal pelvic stabilization
 - Non-invasive techniques
 - Military anti-shock trouser (MAST)
 - Bed sheet tied tightly around the pelvis as manual reduction of the pelvic fracture
 - Proprietary devices specifically designed and marketed for such use.
2. Pelvic angiography
3. Embolization
4. Laparotomy
 - Urgent laparotomy
 - Emergent laparotomy
5. Modalities to determine if laparotomy (to control hemorrhage) is warranted:
 - Diagnostic peritoneal lavage
 - Diagnostic peritoneal tap
 - Ultrasound (focused assessment for the sonographic examination of trauma patient [FAST])
 - Computed tomography (CT) scan

MAJOR OUTCOMES CONSIDERED

- Changes in pelvic volume
- Degree of control of pelvic bleeding
- Sensitivity and specificity, accuracy, positive/negative predictive value of diagnostic procedures
- Transfusion requirements
- Mortality due to pelvic fracture hemorrhage
- Hemodynamic stability

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

A computerized search of the world's literature was undertaken using Medline extending back to 1970 using the key words "pelvic fracture". The 459 citations were identified. The abstract for each was reviewed, and all papers having possible applicability to the guideline topic were retrieved and reviewed. General reviews, letters to the Editor, single case reports, and retrospective reviews of poor quality were excluded. This left 35 manuscripts, which were felt to have sufficient merit to form the basis for the guidelines. These manuscripts were then specifically reviewed and categorized as Class I, II, or, III references.

NUMBER OF SOURCE DOCUMENTS

35 articles

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Evidence Classification Scheme:

Class I: Prospective randomized studies

Class II: Prospective, non-comparative studies; retrospective series with controls

Class III: Retrospective analyses (case series, databases or registries, case reviews)

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Level I: The recommendation is convincingly justifiable based on the available scientific information alone. This recommendation is usually based on Class I data, however, strong Class II evidence may form the basis for a Level I recommendation, especially if the issue does not lend itself to testing in a

randomized format. Conversely, low quality or contradictory Class I data may not be able to support a Level I recommendation.

Level II: The recommendation is reasonably justifiable by available scientific evidence and strongly supported by expert opinion. This recommendation is usually supported by Class II data or a preponderance of Class III evidence.

Level III: The recommendation is supported by available data but adequate scientific evidence is lacking. This recommendation is generally supported by Class III data. This type of recommendation is useful for educational purposes and in guiding future clinical research.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The draft document is submitted to all members of the panel for review and modification. Subsequently the guidelines are forwarded to the chairmen of the Eastern Association of Trauma ad hoc committee for guideline development. Final modifications are made and the document is forwarded back to the individual panel chairpersons.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Level of recommendation (I-III), and the class of data grading (I-III) are defined at the end of the "Major Recommendations" field.

Hypotension associated with major pelvic fractures continues to represent one of the most challenging injury patterns to address. In conjunction with the potential associated injuries, a straightforward outline to the therapeutic options or treatment algorithm becomes so complex as to not be useful in practice. The fundamental issues in addressing hypotension and hemorrhage associated with pelvic fracture have remained constant, however. First, is laparotomy indicated, and second, how is bleeding deep in the pelvis best managed? Based on the review of the literature, the decision for laparotomy should be based on the traditional signs of intra-abdominal bleeding or intestinal perforation. The supra-umbilical diagnostic peritoneal tap appears to be the most reliable test for intra-abdominal hemorrhage, which requires laparotomy. Perforation would be addressed through the microscopic evaluation of the lavage fluid. Management of pelvic hemorrhage appears best managed by initial stabilization of the pelvic bones with re-apposition of the fracture followed by pelvic angiography and possible embolization based on the response to pelvic stabilization.

A. Level I Recommendations

There are no Class I references upon which level I recommendations can be made.

B. Level II Recommendations

1. Which patients with pelvic fracture warrant early external stabilization?
 - a. Patients with evidence of unstable fractures of the pelvis associated with hypotension should be considered for some form of external pelvic stabilization.
 - b. Patients with evidence of unstable pelvic fractures who warrant laparotomy should receive external pelvic stabilization prior to laparotomy incision.
2. Which patients warrant angiography and possible embolization?
 - a. Patients with a major pelvic fracture who have signs of ongoing bleeding after non-pelvic sources of blood loss have been ruled out should be considered for pelvic angiography and possible embolization.
 - b. Patients with major pelvic fracture who are found to have bleeding in the pelvis, which cannot be adequately controlled at laparotomy, should be considered for pelvic angiography and possible embolization.
 - c. Patients with evidence of arterial extravasation of intravenous contrast in the pelvis by computed tomography should be considered for pelvic angiography and possible embolization.
3. Which patients with pelvic fracture warrant urgent or emergent laparotomy?
 - a. Patients with hypotension and gross blood in the abdomen or evidence of intestinal perforation warrant emergent laparotomy. The diagnostic peritoneal tap appears to be the most reliable diagnostic test for this purpose.
 - b. Urgent laparotomy is warranted for patients who demonstrate signs of continued intra-abdominal bleeding after adequate resuscitation, or evidence of intestinal perforation.

C. Level III Recommendations

1. Which patients with pelvic fracture warrant early external stabilization?
 - a. Patients with evidence of unstable fractures of the pelvis not associated with hypotension but who do require a steady and ongoing resuscitation should be considered for some form of external pelvic stabilization.
2. Which patients warrant angiography and possible embolization?
 - a. There are no level III recommendations.
3. Which patients with pelvic fracture warrant urgent or emergent laparotomy?
 - a. There are no level III recommendations.

Definitions:

Recommendation Scheme:

Level I: The recommendation is convincingly justifiable based on the available scientific information alone. This recommendation is usually based on Class I data,

however, strong Class II evidence may form the basis for a Level I recommendation, especially if the issue does not lend itself to testing in a randomized format. Conversely, low quality or contradictory Class I data may not be able to support a Level I recommendation.

Level II: The recommendation is reasonably justifiable by available scientific evidence and strongly supported by expert opinion. This recommendation is usually supported by Class II data or a preponderance of Class III evidence.

Level III: The recommendation is supported by available data but adequate scientific evidence is lacking. This recommendation is generally supported by Class III data. This type of recommendation is useful for educational purposes and in guiding future clinical research.

Classification Scheme

Class I: Prospective randomized studies

Class II: Prospective, non-comparative studies; retrospective series with controls

Class III: Retrospective analyses (case series, databases or registries, case reviews)

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Conclusions were based on evidence obtained from prospective randomized studies (Class I); prospective, non-comparative studies; retrospective series with controls (Class II); or retrospective analyses (case series, databases or registries, case reviews (Class III). The evidentiary tables included no Class I references, fifteen Class II references, and twenty Class III references.

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Decreased morbidity and mortality due to hemorrhage in pelvic fracture

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The guideline developers make the following recommendations regarding implementation:

Implementation involves extensive education and inservicing of nursing, resident, and attending staff members and has one important guiding principle: the guidelines must be available to the clinicians in real time while they are actually seeing the patient. The two most common ways to apply these are by using either a critical pathway or a clinical management protocol. A critical pathway is a calendar of expected events that has been found to be very useful within designated diagnosis-related groups. In trauma, where there are multiple diagnosis-related groups used for one patient, pathways have not been found to be easily applied with the exception of isolated injuries. Clinical management protocols, on the other hand, are annotated algorithms that answer the "if, then" decision making problems and have been found to be easily applied to problem-, process-, or disease-related topics. The clinical management protocol consists of an introduction, an annotated algorithm and a reference page. The algorithm is a series of "if, then" decision making processes. There is a defined entry point followed by a clinical judgment and/or assessment, followed by actions, which are then followed by outcomes and/or endpoints. The advantages of algorithms are that they convey the scope of the guideline, while at the same time organize the decision making process in a user-friendly fashion. The algorithms themselves are systems of classification and identification that should summarize the recommendations contained within a guideline. It is felt that in the trauma and critical care setting, clinical management protocols may be more easily applied than critical pathways, however, either is acceptable provided that the formulated guidelines are followed. After appropriate inservicing, a pretest of the planned guideline should be performed on a limited patient population in the clinical setting. This will serve to identify potential pitfalls. The pretest should include written documentation of experiences with the protocol, observation, and suggestions. Additionally, the guidelines will be forwarded to the chairpersons of the multi-institutional trials committees of the Eastern Association for the Surgery of Trauma, the Western Association for the Surgery of Trauma, and the American Association for the Surgery of Trauma. Appropriate guidelines can then be potentially selected for multi-institutional study. This process will facilitate the development of user friendly pathways or protocols as well as evaluation of the particular guidelines in an outcome based fashion.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

EAST Practice Management Guidelines Work Group. Practice management guidelines for hemorrhage in pelvic fracture. Allentown (PA): Eastern Association for the Surgery of Trauma (EAST); 2001. 15 p. [34 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001

GUIDELINE DEVELOPER(S)

Eastern Association for the Surgery of Trauma - Professional Association

SOURCE(S) OF FUNDING

Eastern Association for the Surgery of Trauma (EAST)

GUIDELINE COMMITTEE

EAST Practice Management Guidelines Work Group

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Work Group Members: J. Christopher DiGiacomo, MD; John A. Bonadies, MD; Frederic J. Cole, M.D.; Lawrence Diebel, MD; William S. Hoff, MD; Michele Holevar, MD; John Malcynski, MD; Thomas Scalea, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the [Eastern Association for the Surgery of Trauma \(EAST\) Web site](#).

Print copies: Available from the EAST Guidelines, c/o Fred Luchette, MD, Loyola University Medical Center, Department of Surgery Bldg. 110-3276, 2160 S. First Avenue, Maywood, IL 60153; Phone: (708) 327-2680; E-mail: fluchet@lumc.edu.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Practice management guidelines for trauma: East Ad Hoc Committee on Guideline Development (Unabridged: Revised 1998 Mar 20). Available from the [Eastern Association for the Surgery of Trauma \(EAST\) Web site](#).

An excerpt is also available:

- Pasquale M, Fabian TC. Practice management guidelines for trauma from the Eastern Association for the Surgery of Trauma. J Trauma 1998 Jun;44(6):941-56; discussion 956-7.

Also available:

- Utilizing evidence based outcome measures to develop practice management guidelines: a primer. Allentown (PA): Eastern Association for the Surgery of Trauma; 2000. 18 p. Available from the [EAST Web site](#).

Print copies: Available from the EAST Guidelines, c/o Fred Luchette, MD, Loyola University Medical Center, Department of Surgery Bldg. 110-3276, 2160 S. First Avenue, Maywood, IL 60153; Phone: (708) 327-2680; E-mail: fluchet@lumc.edu.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on February 27, 2002. The information was verified by the guideline developer as of March 26, 2002.

COPYRIGHT STATEMENT

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